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That I am knowledgeable in the English language and in the Korean language;

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That the English Translations attached hereto are true and complete translation of the Korean language priority document of KR application no. 10-2002-0049637 and 10-2002-0062522, and

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Respectfully submitted,

2009-2-26
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ABSTRACT

Summary

A high-density optical disc such as BD-RW (Blu-ray Disc Rewritable) or BD-ROM, and a reproducing method thereof are disclosed. Diverse additional information such as disc reflectivity information, zone type information, data type information, or disc type information is efficiently recorded in a particular 1-byte address field included in an address unit recorded with a predetermined size on the high-density optical disc so that it can be read when a data recording or reproducing operation for the high-density optical disc is carried out. Accordingly, it is possible to achieve optimal optical power control and identification of a current position, while enabling a normal data recording or reproducing operation corresponding to the data type and the type of the optical disc.

Key Figure

Figure 4

Key Words

Rewritable Blu-ray disc, Read-only Blue-ray disc, address unit, disc reflectivity information, data type information, disc type information

SPECIFICATION

Title

HIGH DENSITY OPTICAL DISC AND METHOD FOR REPRODUCING THEM

Brief Description Of The Drawings

Fig. 1 is a schematic view illustrating the structure of a data frame in a general DVD;

Fig. 2 is a schematic view illustrating the structure of

sector information in a general DVD;

Fig. 3 is a schematic view illustrating the structure of an address unit on a high-density optical disc according to an embodiment of the present invention;

Fig. 4 is a schematic view illustrating the structure of a particular address field on the high-density optical disc according to the embodiment of the present invention;

Fig. 5 is a schematic view illustrating the structure of a physical ADIP (Address In Pre-groove) address on the high-density optical disc according to the embodiment of the present invention; and

Fig. 6 is a schematic block diagram illustrating the configuration of an optical disc apparatus for recording data on the high-density optical disc or reproducing data recorded on the high-density optical disc according to the embodiment of the present invention.

Major Elements In Drawings

10 : optical disc 11 : optical pickup

12 : video disc playing (VDP) system

13 : encoder

Background Of The Invention

The present invention relates to a high-density optical disc such as BD-RW (Blu-ray Disc Rewritable) or BD-ROM, and a reproducing method thereof.

Recently, high-density optical discs have been developed, for example, DVD (Digital Versatile Disc), which can store a large quantity of high-quality video and audio data. Currently, such high-density optical discs are widely commercially available.

On a DVD, main A/V data is recorded in the unit of sectors each having a size of 2,084 bytes, as shown in Fig. 1. In each sector of 2,048 bytes, additional information of 16 bytes is recorded which may include ID (Identification Data), IED (ID Error Detection Code), CPR_MAI (Copyright Management Information), and EDC (Error Detection Code).

The sector ID information, which is included in the additional information, consists of 4 bytes including 1-byte sector information and 3-byte sector number information, as shown in Fig. 2.

The 1-byte sector information includes sector format type information, tracking method information, disc reflectivity information, reserved information, data type information, and layer number information, each of which has a size of 1 bit. The sector information also includes area type information of 2 bits.

For example, where the sector formation type information corresponds to '0b', it represents that the main A/V data recorded on the associated sector can be reproduced or recorded by a CLV (Constant Linear Velocity) type. On the other hand, where the sector formation type information corresponds to '1b', it represents that the main A/V data recorded on the associated sector can be reproduced or recorded by different types for different zones, respectively.

Also, where the tracking method information corresponds to '0b', it represents a pit-based tracking operation. On the other hand, where the tracking method information corresponds to '1b', it represents a groove-based tracking operation. Where the disc reflectivity information corresponds to '0b', it represents a reflectivity of more than 40%. On the other hand, where the reflectivity information corresponds to '1b', it represents a reflectivity of not more than 40%.

Meanwhile, where the area type information corresponds

to '00b', it represents that the current position corresponds to a data area. Also, where the area type information corresponds to '01b', it represents that the current position corresponds to a lead-in area. The area type information corresponding to '10b' represents a lead-out area, whereas the area type information corresponding to '11b' represents a middle area on a dual layer optical disc. Where the data type information corresponds to '0b', it represents that the main A/V data of the associated sector is read-only data. On the other hand, where the data type information corresponds to '1b', it represents that the main A/V data of the associated sector is data other than read-only data.

Also, where the layer number information corresponds to '0b', it represents that the current disc has a single layer or that the current layer is a first layer Layer 0 in a dual layer optical disc. On the other hand, where the layer number information corresponds to '1b', it represents that the current layer is a second layer Layer 1 in the dual layer optical disc.

Accordingly, once such a DVD is loaded in an optical disc apparatus, the optical disc apparatus reads sector format type information, tracking method information, disc reflectivity information, data type information, layer number information, and area type information recorded on the DVD as sector information, in order to normally carry out a data recording or reproducing operation corresponding to the read information.

Meanwhile, standardization of new high-density optical discs such as BD-RW and BD-ROM has recently been conducted by associated companies. However, the data format of such BDs is essentially different from that of DVDs. Furthermore, there is no method for effectively and appropriately recording diverse information corresponding to sector information, as

recorded on a DVD, on the above mentioned high-density optical disc. Accordingly, such a method is strongly demanded.

Explanation Of The Invention

The present invention has been made in view of the above-mentioned problems, and an object of the invention is to provide a high-density optical disc such as BD-RW or BD-ROM and a reproducing method thereof in which diverse additional information corresponding to sector information, as used in a DVD, is efficiently recorded in a particular 1-byte address field included in an address unit recorded with a predetermined size on the high-density optical disc so that it can be read when a data recording or reproducing operation for the high-density optical disc is carried out.

In accordance with one aspect, the present invention provides a high-density optical disc, comprising: an address unit, wherein at least one of disc reflectivity information, zone type information, data type information, and disc type information is recorded in a particular address field of a size of 1 byte included in the address unit of a predetermined size recorded on the optical disc.

In accordance with another aspect, the present invention provides a reproducing method for a high-density optical disc, comprising the steps of: identifying information recorded in a particular address field of 1 byte included in an address unit read and reproduced from the optical disc; and controlling a data reproducing operation based on the identified information.

Hereinafter, preferred embodiments of a high-density

optical disc and a recording/reproducing method thereof according to the present invention will be described in detail with reference to the annexed drawings.

The high-density optical disc according to the present invention may be either a BD-RW or a BD-ROM. As shown in Fig. 3, an address unit having a size of 16 addresses x 9 bytes (rows) is recorded on the high-density optical disc.

Meanwhile, diverse additional information corresponding to sector information, as used in a DVD and described above in conjunction with Fig. 2, is recorded in a particular 1-byte address field of the address unit having a size of 16 addresses x 9 bytes (rows), for example, an address field corresponding to a row number of '4' and an address number of 'S', AF4,S (S = 0, 1,..., 15).

As shown in Fig. 4, the additional information recorded in the address field AF4,S may be disc reflectivity information, zone type information, data type information, and disc type information, each of which has a size of 2 bits.

Where the 2-bit reflectivity information 'b5b4' corresponds to '00b', it represents that the optical disc has a low reflectivity lower than a first predetermined reference value. Also, the reflectivity information 'b5b4' corresponding to '01b' represents that the optical disc has a middle reflectivity being higher than the first predetermined reference value and lower than a second predetermined reference value, whereas the reflectivity information 'b5b4' corresponding to '11b' represents that the optical disc has a high reflectivity higher than the second predetermined reference value.

For reference, the recording density of a BD-RW or BD-ROM is about 5 times as high as that of general DVDs. By virtue of such a high recording density, it is possible to allocate 2 bits to reflectivity information in the case of

the BD-RW or BD-ROM, so that the reflectivity information can be more finely defined. Accordingly, more appropriate OPC (Optical Power Control) and AGC (Automatic Gain Control) can be carried out during data recording and reproducing operations.

Where the zone type information corresponds to '00b', it represents that the current position corresponds to a data zone. The zone type information corresponding to '01b' represents an inner zone, whereas the zone type information corresponding to '10b' represents an outer zone. The zone type information is linked to the layer number information recorded in a state of being included in a physical ADIP address.

For example, where the zone type information corresponds to '01b' representing an inner zone under the condition in which the current layer is determined to be the first layer of a dual layer structure, based on the layer number information, the current position corresponds to the lead-in zone of the first layer. On the other hand, where the zone type information corresponds to '01b' representing an inner zone under the condition in which the current layer is determined to be the second layer of a dual layer structure, the current position corresponds to the lead-out zone of the second layer.

Meanwhile, where the data type information corresponds to '00b', it represents that the associated main A/V data is read-only data. Also, the data type information corresponding to '01b' represents recordable data, whereas the data type information corresponding to '10b' represents rewritable data.

Also, where the disc type information corresponds to '00b', it represents that the associated optical disc is a BD-ROM. On the other hand, the disc type information corresponding to '01b' represents a BD-R, whereas the disc

type information corresponding to '10b' represents a BD-RW.

Accordingly, when a BD-RW or BD-ROM according to the embodiment of the present invention is loaded in the optical disc apparatus, the optical disc apparatus reads the reflectivity information, zone type information, data type information and disc type information recorded in the address unit of the optical disc while performing a data recording or reproducing operation thereof, so that it normally carries out the data recording or reproducing operation, based on the read information.

Although the preferred embodiments of the invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Effect Of The Invention

As apparent from the above description, the present invention provides a high-density optical disc and a recording/reproducing method thereof which enable optimal optical power control and identification of a current position, while enabling a normal data recording or reproducing operation corresponding to the data type and the disc type.

WHAT IS CLAIMED IS:

1. A high-density optical disc, comprising:

an address unit,

wherein at least one of disc reflectivity information, zone type information, data type information, and disc type

information is recorded in a particular address field of a size of 1 byte included in the address unit of a predetermined size recorded on the optical disc.

2. The high-density optical disc according to claim 1, wherein the optical disc is a BD-RW (Blu-ray Disc Rewritable) or a BD-ROM.

3. The high-density optical disc according to claim 2, wherein the address unit has a size of 16 addresses x 9 rows (bytes), and the particular address field is a 1-byte address field included in the address unit while corresponding to a row number of '4' and an address number of 'S' ($AF_{4,S}$ (S = 0, 1,…, 15)).

4. The high-density optical disc according to claim 1, wherein the disc reflectivity information is required for an optical power control and an automatic gain control when a data recording or reproducing operation is carried out while having a size of 2 bits for representing low, middle and high levels.

5. The high-density optical disc according to claim 1, wherein the zone type information represents a current position of the optical disc when a data recording or reproducing operation is carried out while having a size of 2 bits, the current position corresponding to a data zone, an inner zone, or an outer zone.

6. The high-density optical disc according to claim 1, wherein the data type information represents the type of associated data when a data recording or reproducing operation is carried out while having a size of 2 bits, the

associated data being read-only data, recordable data or rewritable data.

7. The high-density optical disc according to claim 1, wherein the disc type information represents the type of the optical disc, the optical disc being a BD-ROM, a BD-R (BD-Recordable), or BD-RW (Blu-ray Disc Rewritable).

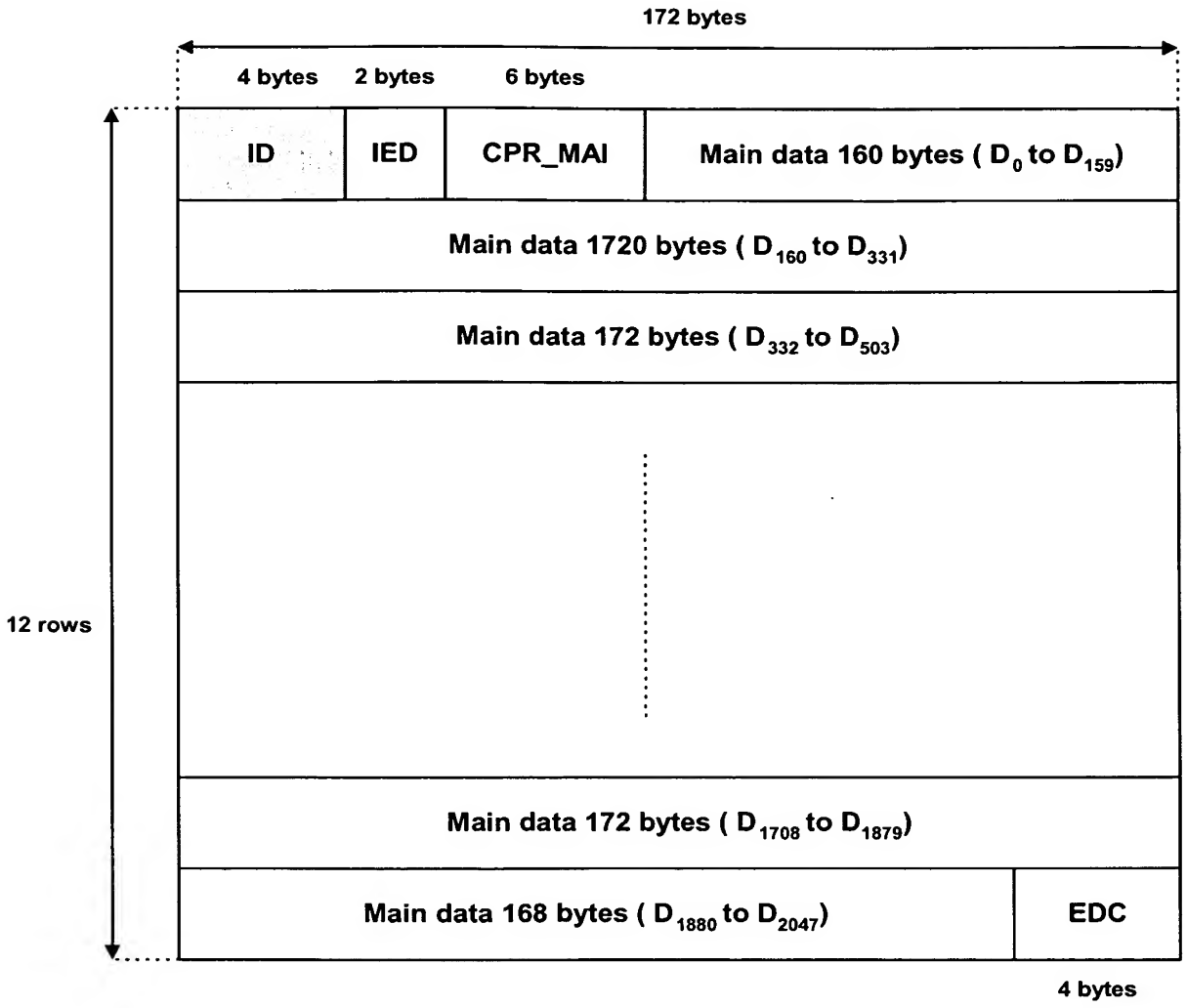
8. A reproducing method for a high-density optical disc, comprising the steps of:

identifying information recorded in a particular address field of 1 byte included in an address unit read and reproduced from the optical disc; and

controlling a data reproducing operation based on the identified information.

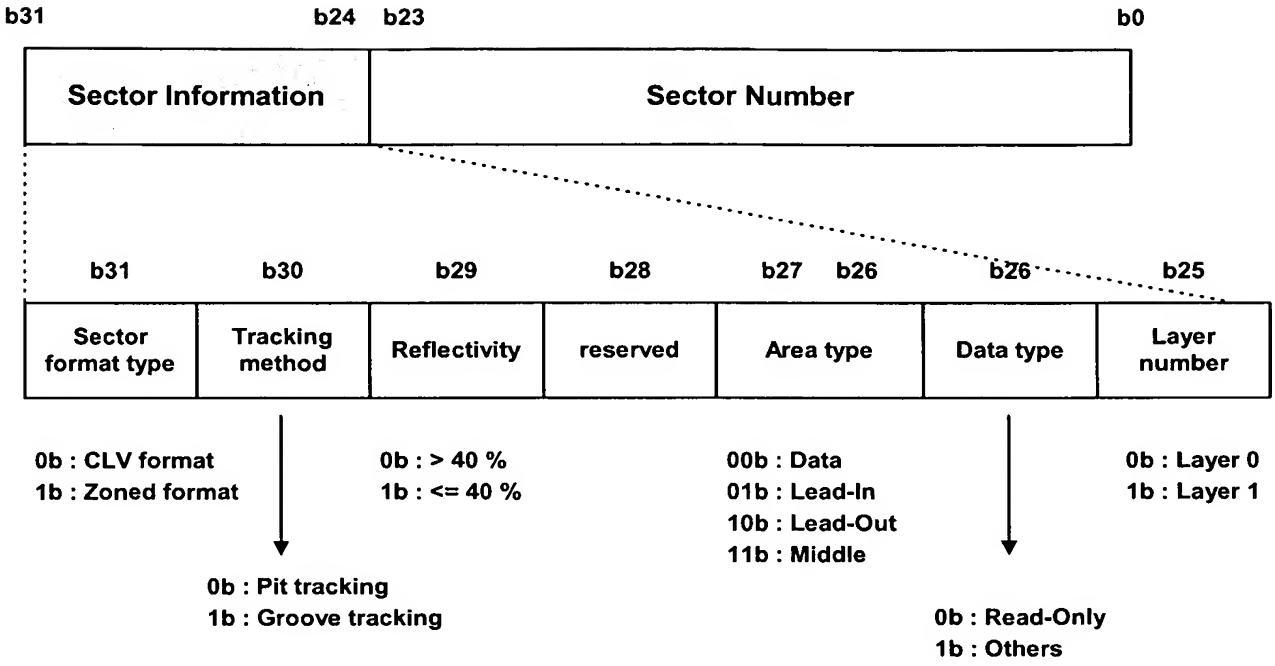
9. The reproducing method according to claim 8, wherein the particular address field is recorded with at least one of disc reflectivity information, zone type information, data type information, and disc type information.

[Fig. 1]

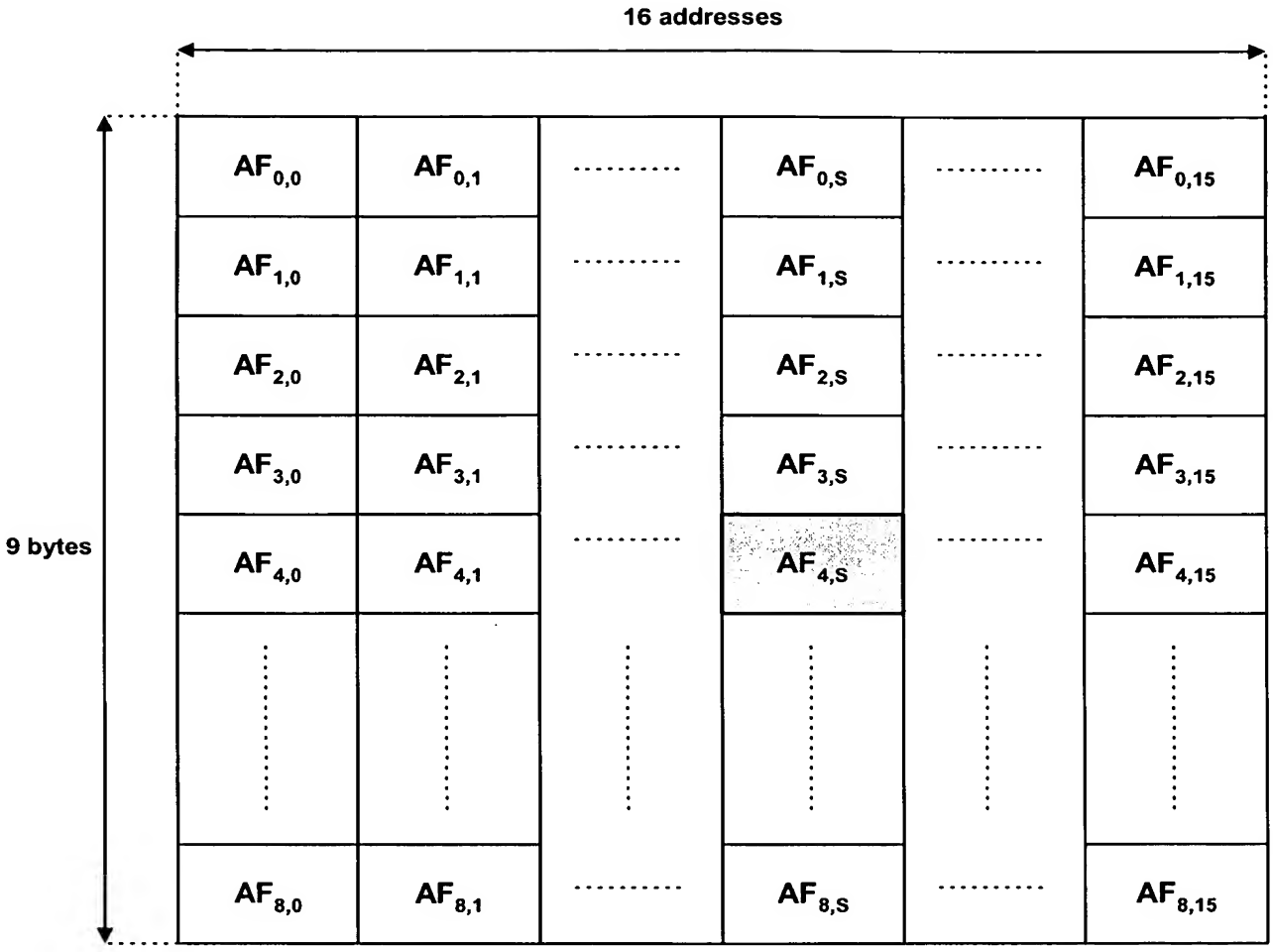


DVD - Data Frame

[Fig. 2]

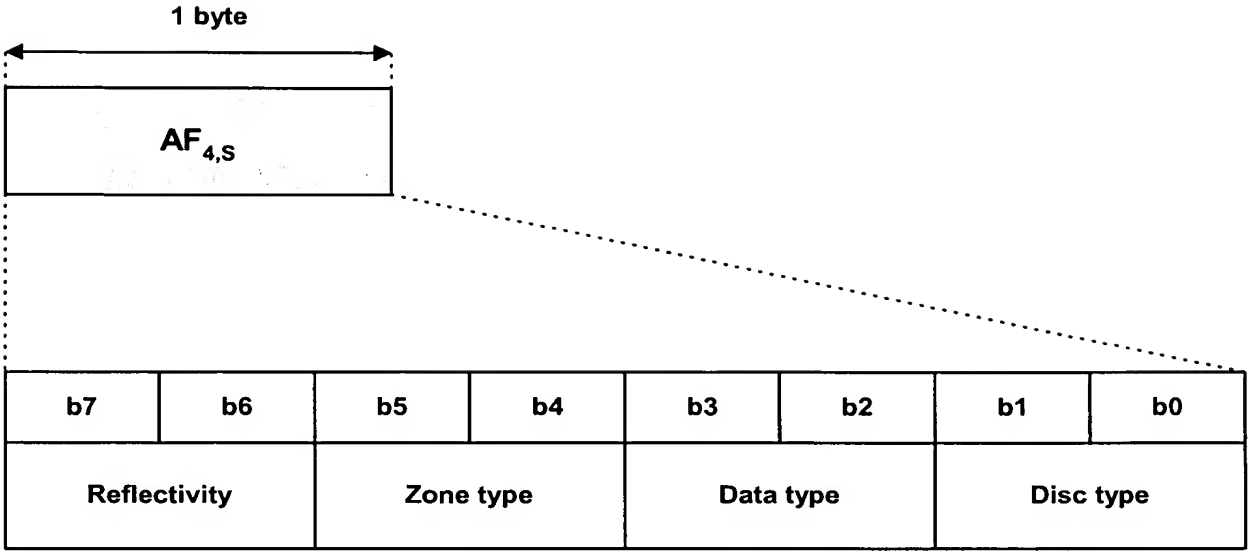

b31
b24
b23
b0
Sector Information
Sector Number
b31
b30
b29
b28
b27
b26
b26
b25
Sector format type
Tracking method
Reflectivity
reserved
Area type
Data type
Layer number
0b : CLV format
1b : Zoned format
0b : Pit tracking
1b : Groove tracking
0b : > 40 %
1b : <= 40 %
00b : Data
01b : Lead-In
10b : Lead-Out
11b : Middle
0b : Read-Only
1b : Others
0b : Layer 0
1b : Layer 1

[Fig. 3]



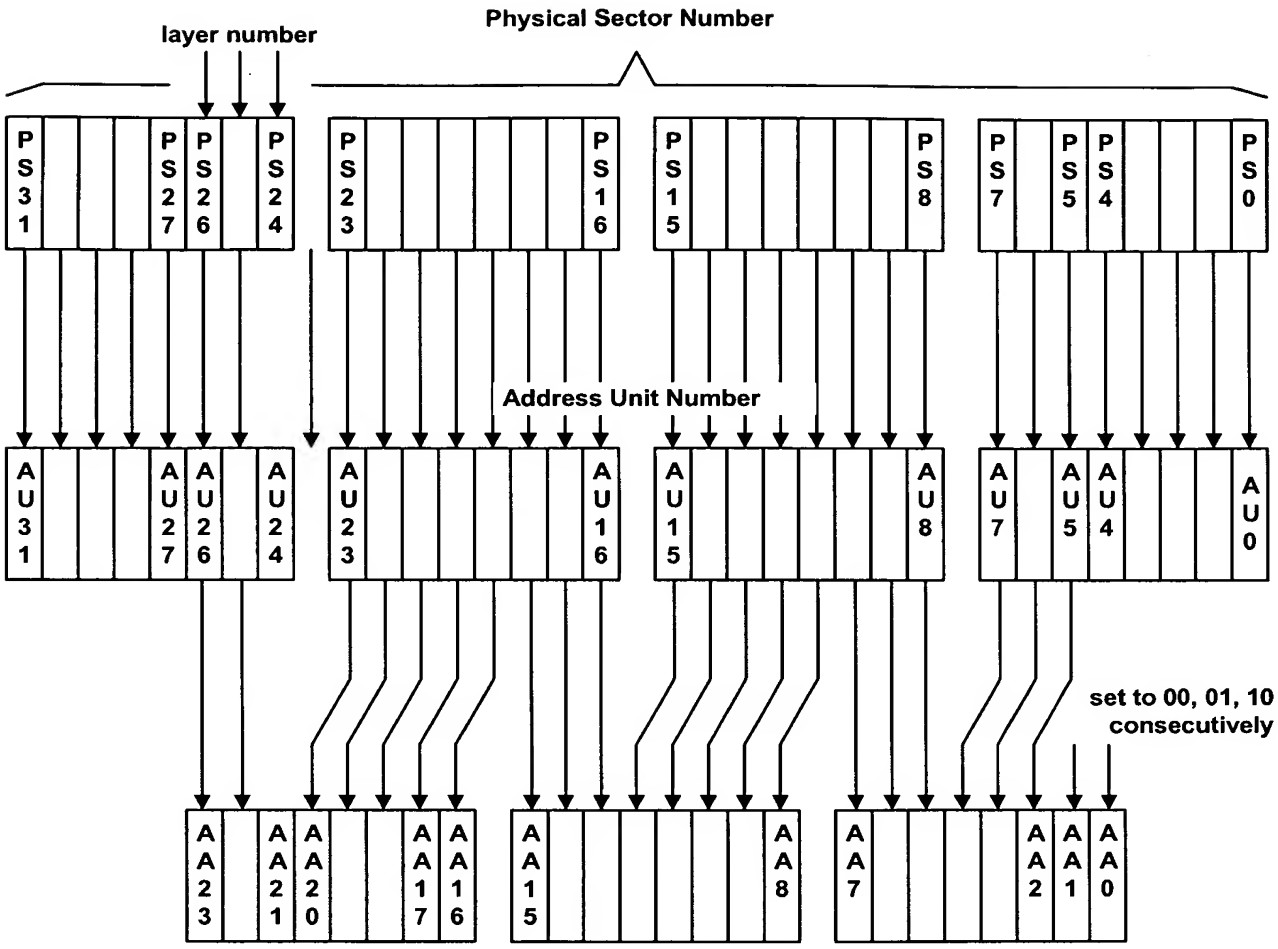
BD - Address Unit

[Fig. 4]



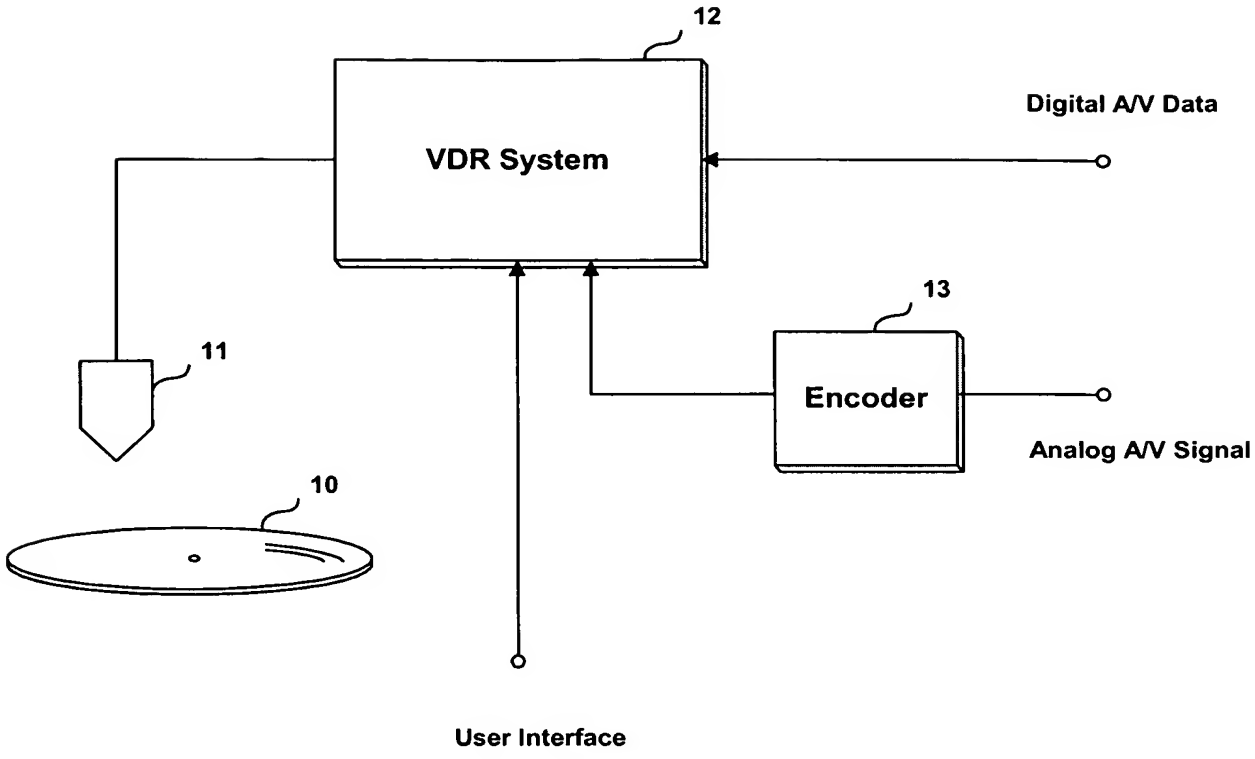
00b : Reserved	00b : Reserved	00b : Reserved	00b : Reserved
01b : Low	01b : Data zone	01b : Read-only	01b : Read-only
10b : Middle	10b : Inner zone	10b : Rewritable	10b : Rewritable
11b : High	11b : Outer zone	11b : Recordable	11b : Recordable

[Fig. 5]



Physical ADIP Address

[Fig. 6]


12
VDR System
Digital A/V Data
13
Encoder
Analog A/V Signal
11
10
User Interface

ABSTRACT

Summary

A high-density optical disc such as BD-RW (Blu-ray Disc Rewritable) or BD-ROM, and a reproducing method thereof are disclosed. Diverse additional information such as disc reflectivity information, disc layer information or disc type information is efficiently recorded in a particular information field included in a data unit recorded with a predetermined size on the burst cutting area of a high-density optical disc so that it can be read when the high-density optical disc is loaded in an optical disc apparatus. Accordingly, it is possible to achieve optimal optical power control and automatic gain control, while enabling a normal data recording or reproducing operation corresponding to the type of the optical disc and the disc layer.

Key Figure

Figure 5

Key Words

Rewritable Blu-ray disc, Read-only Blue-ray disc, Burst Cutting Area, data unit information field, disc reflectivity information, disc layer information, disc type information

SPECIFICATION

Title

HIGH DENSITY OPTICAL DISC AND METHOD FOR REPRODUCING THEM

Brief Description Of The Drawings

Fig. 1 is a schematic view illustrating the structure of a data frame in a general DVD;

Fig. 2 is a schematic view illustrating the structure of sector information in a general DVD;

Fig. 3 is a schematic view illustrating a BCA on a high-density optical disc according to the present invention;

Fig. 4 is a schematic view illustrating the structure of data units on a high-density optical disc according to an embodiment of the present invention;

Fig. 5 is a schematic view illustrating one exemplary structure of a particular information field on the high-density optical disc according to the first embodiment of the present invention;

Fig. 6 is a schematic view illustrating another exemplary structure of a particular information field on the high-density optical disc according to the first embodiment of the present invention; and

Fig. 7 is a schematic block diagram illustrating the configuration of an optical disc apparatus for recording data on the high-density optical disc or reproducing data recorded on the high-density optical disc according to the embodiment of the present invention.

Major Elements In Drawings

10 : optical disc 11 : optical pickup

12 : video disc playing (VDP) system

13 : encoder

Background Of The Invention

The present invention relates to a high-density optical disc such as BD-RW (Blu-ray Disc Rewritable) or BD-ROM, and a reproducing method thereof.

Recently, high-density optical discs have been developed, for example, DVD (Digital Versatile Disc), which can store a large quantity of high-quality video and audio data.

Currently, such high-density optical discs are widely commercially available.

On a DVD, main A/V data is recorded in the unit of sectors each having a size of 2,084 bytes, as shown in Fig. 1. In each sector of 2,048 bytes, additional information of 16 bytes is recorded which may include ID (Identification Data), IED (ID Error Detection Code), CPR_MAI (Copyright Management Information), and EDC (Error Detection Code).

The sector ID information, which is included in the additional information, consists of 4 bytes including 1-byte sector information and 3-byte sector number information, as shown in Fig. 2.

The 1-byte sector information includes sector format type information, tracking method information, disc reflectivity information, reserved information, data type information, and layer number information, each of which has a size of 1 bit. The sector information also includes area type information of 2 bits.

For example, where the sector formation type information corresponds to '0b', it represents that the main A/V data recorded on the associated sector can be reproduced or recorded by a CLV (Constant Linear Velocity) type. On the other hand, where the sector formation type information corresponds to '1b', it represents that the main A/V data recorded on the associated sector can be reproduced or recorded by different types for different zones, respectively.

Also, where the tracking method information corresponds to '0b', it represents a pit-based tracking operation. On the other hand, where the tracking method information corresponds to '1b', it represents a groove-based tracking operation. Where the disc reflectivity information corresponds to '0b', it represents a reflectivity of more than 40%. On the other hand, where the reflectivity information corresponds to '1b',

it represents a reflectivity of not more than 40%.

Meanwhile, where the area type information corresponds to '00b', it represents that the current position corresponds to a data area. Also, where the area type information corresponds to '01b', it represents that the current position corresponds to a lead-in area. The area type information corresponding to '10b' represents a lead-out area, whereas the area type information corresponding to '11b' represents a middle area on a dual layer optical disc. Where the data type information corresponds to '0b', it represents that the main A/V data of the associated sector is read-only data. On the other hand, where the data type information corresponds to '1b', it represents that the main A/V data of the associated sector is data other than read-only data.

Also, where the layer number information corresponds to '0b', it represents that the current disc has a single layer or that the current layer is a first layer Layer 0 in a dual layer optical disc. On the other hand, where the layer number information corresponds to '1b', it represents that the current layer is a second layer Layer 1 in the dual layer optical disc.

Accordingly, once such a DVD is loaded in an optical disc apparatus, the optical disc apparatus reads sector format type information, tracking method information, disc reflectivity information, data type information, layer number information, and area type information recorded on the DVD as sector information, in order to normally carry out a data recording or reproducing operation corresponding to the read information.

Meanwhile, standardization of new high-density optical discs such as BD-RW and BD-ROM has recently been conducted by associated companies. However, the data format of such BDs is essentially different from that of DVDs. Furthermore, there

is no method for effectively and appropriately recording diverse information corresponding to sector information, as recorded on a DVD, on the above mentioned high-density optical disc. Accordingly, such a method is strongly demanded.

Explanation Of The Invention

The present invention has been made in view of the above-mentioned problems, and an object of the invention is to provide a high-density optical disc such as BD-RW or BD-ROM and a reproducing method thereof in which diverse additional information corresponding to sector information, as used in a DVD, is efficiently recorded in a particular information field included in a data unit recorded with a predetermined size on a burst cutting area of the high-density optical disc so that it can be read first when the high-density optical disc is loaded in an optical disc apparatus.

In accordance with one aspect, the present invention provides a high-density optical disc, comprising: a burst cutting area, wherein disc reflectivity information is recorded in a particular information field of a data unit having a predetermined size included in the burst cutting area.

In accordance with another aspect, the present invention provides a reproducing method for a high-density optical disc, comprising the steps of: identifying information recorded in a particular information field included in a data unit read from a burst cutting area of the optical disc; and controlling a data reproducing operation, based on the identified information.

Hereinafter, preferred embodiments of a high-density optical disc and a reproducing method thereof according to the present invention will be described in detail with reference to the annexed drawings.

The high-density optical disc according to the present invention may be either a BD-RW or a BD-ROM. A burst cutting area (BCA), which is assigned to the high-density optical disc, as shown in Fig. 3, is an innermost area that the optical disc apparatus first accesses when the high-density optical disc is loaded therein. On the BCA, diverse information such as enciphering information for anti-duplication of the disc is recorded in the form of a BCA code.

As shown in Fig. 4, the BCA code recorded on the BCA has a data structure in which a plurality of data units are successively recorded. Each data unit consists of data of 4 rows including a sync field of 1 byte and an information field of 4 bytes, and parity of 4 rows including a sync field of 1 byte and a carrier field of 4 bytes.

Meanwhile, diverse additional information corresponding to sector information, as used in DVDs and described with reference to Fig. 2, may be recorded in an optional information field in each data unit, for example, a first information field of each data unit, I0,0, I0,1, I0,2, or I0,3. For example, recorded in the first information field I0,0, of each data unit written on the BCA of a BD-ROM may be layer information of 2 bits (b7b6 = Layer), disc reflectivity information of 2 bits (b5b4 = Reflectivity), reserved information of 1 bit (b3 = reserved), application indicator information of 1 bit (b2 = Application Indicator), and data unit sequence number information of 2 bits (b1b0 = Data Unit Sequence Number), as shown in Fig. 5.

In this case, where the 2-bit layer information 'b7b6'

corresponds to '00b', it represents the information for a single layer structure or the first layer (Layer 0) of a dual layer structure. Also, the layer information 'b7b6' corresponding to '01b' represents the information for the second layer (Layer 1) of a dual layer structure. On the other hand, where layer information 'b7b6' corresponds to '10b' or '11b', it may represent the information for the third layer (Layer 2) or the fourth layer (Layer 3) of a multi-layer disc having layers more than a dual layer structure.

Where the 2-bit reflectivity information 'b5b4' corresponds to '00b', it represents that the optical disc has a low reflectivity lower than a first predetermined reference value. Also, the reflectivity information 'b5b4' corresponding to '01b' represents that the optical disc has a middle reflectivity being higher than the first predetermined reference value and lower than a second predetermined reference value, whereas the reflectivity information 'b5b4' corresponding to '11b' represents that the optical disc has a high reflectivity higher than the second predetermined reference value.

For reference, the recording density of a BD-RW or BD-ROM is about 5 times as high as that of general DVDs. By virtue of such a high recording density, it is possible to allocate 2 bits to reflectivity information in the case of the BD-RW or BD-ROM, so that the reflectivity information can be more finely defined. Accordingly, more appropriate OPC (Optical Power Control) and AGC (Automatic Gain Control) can be carried out during data recording and reproducing operations.

Where the 1-bit application indicator information 'b2' corresponds to '0b', it represents nonuse of an anti-duplication system. On the other hand, the application

indicator information 'b2' corresponding to '1b' represents use of the anti-duplication system.

Also, where the 2-bit data unit sequence number information 'b1b0' corresponds to '00b', it represents that the number of the associated data unit is 'Data Unit 0'. The data unit sequence number information 'b1b0' corresponding to '01b' represents 'Data Unit 1', whereas the data unit sequence number information 'b1b0' corresponding to '10b' represents 'Data Unit 2'. On the other hand, the data unit sequence number information 'b1b0' corresponding to '11b' represents 'Data Unit 3'.

Meanwhile, the 2-bit layer information may be substituted with disc type information, as shown in Fig. 6. For example, where the disc type information 'b7b6' corresponds to '00b', it represents a BD-RW type. Also, the disc type information 'b7b6' corresponding to '01b' represents a BD-R (Blu-ray Disc Recordable), whereas the disc type information 'b7b6' corresponding to '10b' represents a BD-ROM.

When a BD-RW or BD-ROM according to the embodiment of the present invention is loaded in an optical disc apparatus including an optical pickup 11, a VDR (Video Disc Recording) system 12, and an encoder 13, as shown in Fig. 7, the optical disc apparatus preferentially accesses the BCA of the optical disc, and reads the reflectivity information recorded in the information field of each data unit, thereby performing OPC and AGC operations.

Also, the optical disc apparatus reads the layer information and disc type information recorded in the information field of each data unit, so that it carries out a normal data recording or reproducing operation, based on the read information.

Although the preferred embodiments of the invention have

been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Effect Of The Invention

As apparent from the above description, the present invention provides a high-density optical disc and a recording/reproducing method thereof which enable optimal optical power control and automatic gain control, while enabling an optimal data recording or reproducing operation corresponding to the type and the layer of the optical disc.

WHAT IS CLAIMED IS:

1. A high-density optical disc, comprising:

a burst cutting area,

wherein disc reflectivity information is recorded in a particular information field of a data unit having a predetermined size included in the burst cutting area.

2. The high-density optical disc according to claim 1, wherein the optical disc is a BD-RW (Blu-ray Disc Rewritable) or a BD-ROM.

3. The high-density optical disc according to claim 1, wherein the burst cutting area is assigned in an innermost area of the optical disc..

4. The high-density optical disc according to claim 3, wherein the particular information field is a first

information field included in the data unit while having a size of 1 byte.

5. The high-density optical disc according to claim 1, wherein the disc reflectivity information is required for an optical power control and an automatic gain control when a data recording or reproducing operation is carried out, has a size of 2 bytes for representing low, middle and high levels and is identified without requiring any separate decoding operation.

6. The high-density optical disc according to claim 1, wherein the particular information field further includes at least one of disc layer information, disc type information, application indicator information, and data unit sequence number.

7. The high-density optical disc according to claim 6, wherein the disc layer information determines which one of a first layer to a fourth layer is a current layer when a data recording or reproducing operation is carried out while having a size of 2 bytes.

8. The high-density optical disc according to claim 6, wherein the disc type information represents a type of the optical disc, the optical disc being a BD-ROM, a BD-R (BD-Recordable), or BD-RW (Blu-ray Disc Rewritable) having a size of 2 bits.

9. The high-density optical disc according to claim 6, wherein the application indicator information represents whether to use an anti-duplication system while having a size of 1 bit or more.

10. The high-density optical disc according to claim 6, wherein data unit sequence number information determines which one of a first data unit to a fourth data unit is a current data unit while having a size of 2 bits.

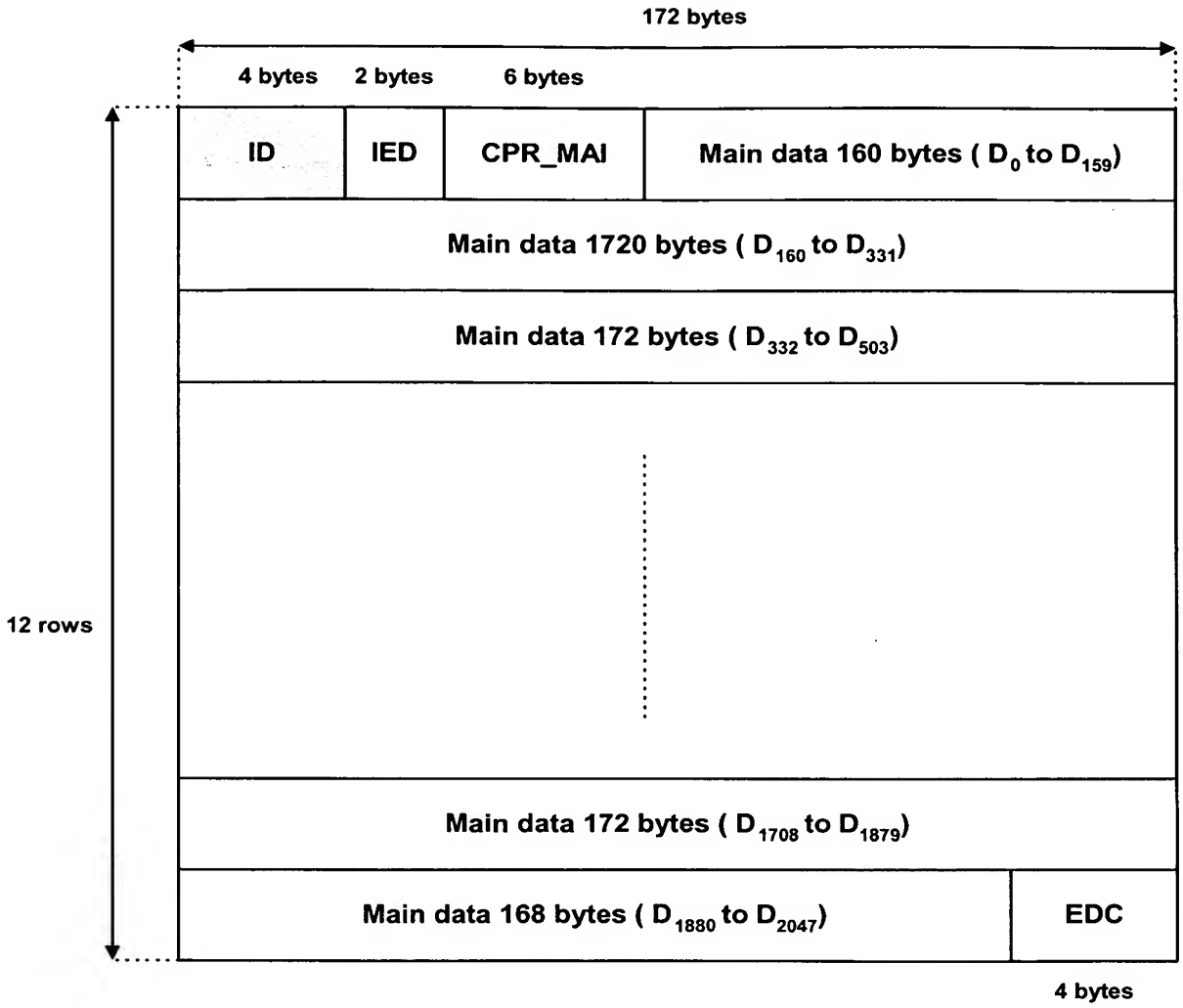
11. A reproducing method for a high-density optical disc, comprising the steps of:

identifying information recorded in a particular information field included in a data unit read from a burst cutting area of the optical disc; and

controlling a data reproducing operation based on the identified information.

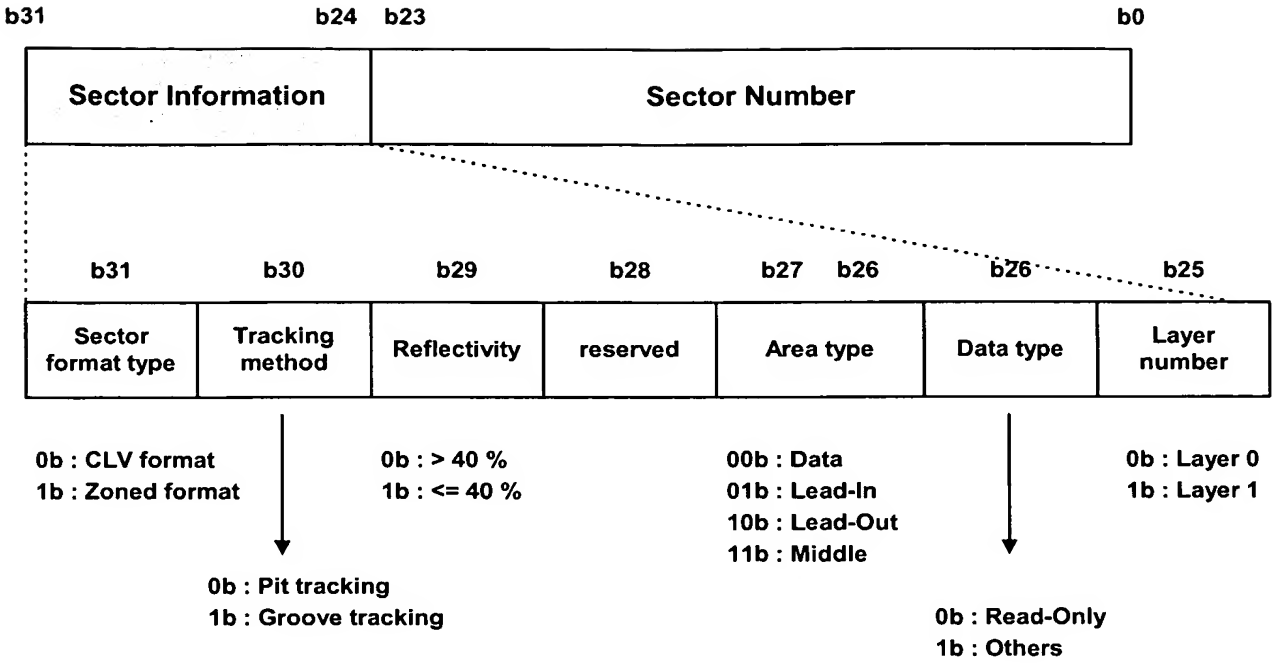
12. The reproducing method according to claim 11, wherein the particular information field is recorded with at least one of disc reflectivity information, disc layer information, disc type information, application indicator information, and data unit sequence number information.

[Fig. 1]



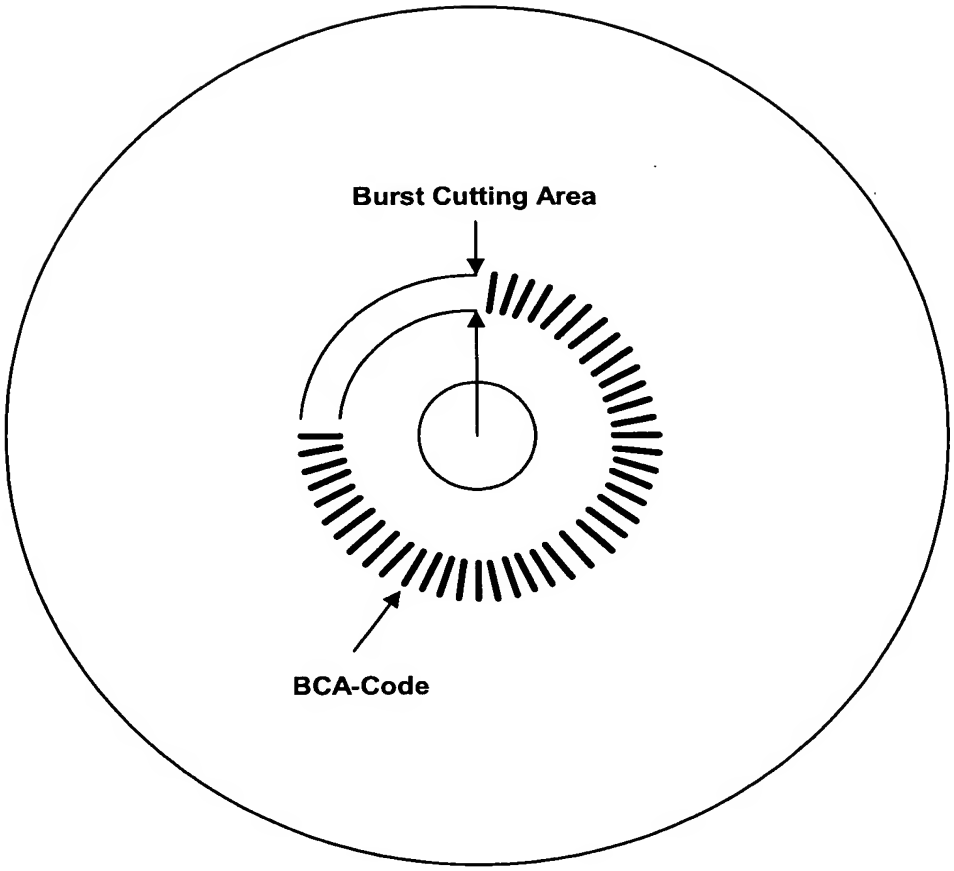
DVD - Data Frame

[Fig. 2]

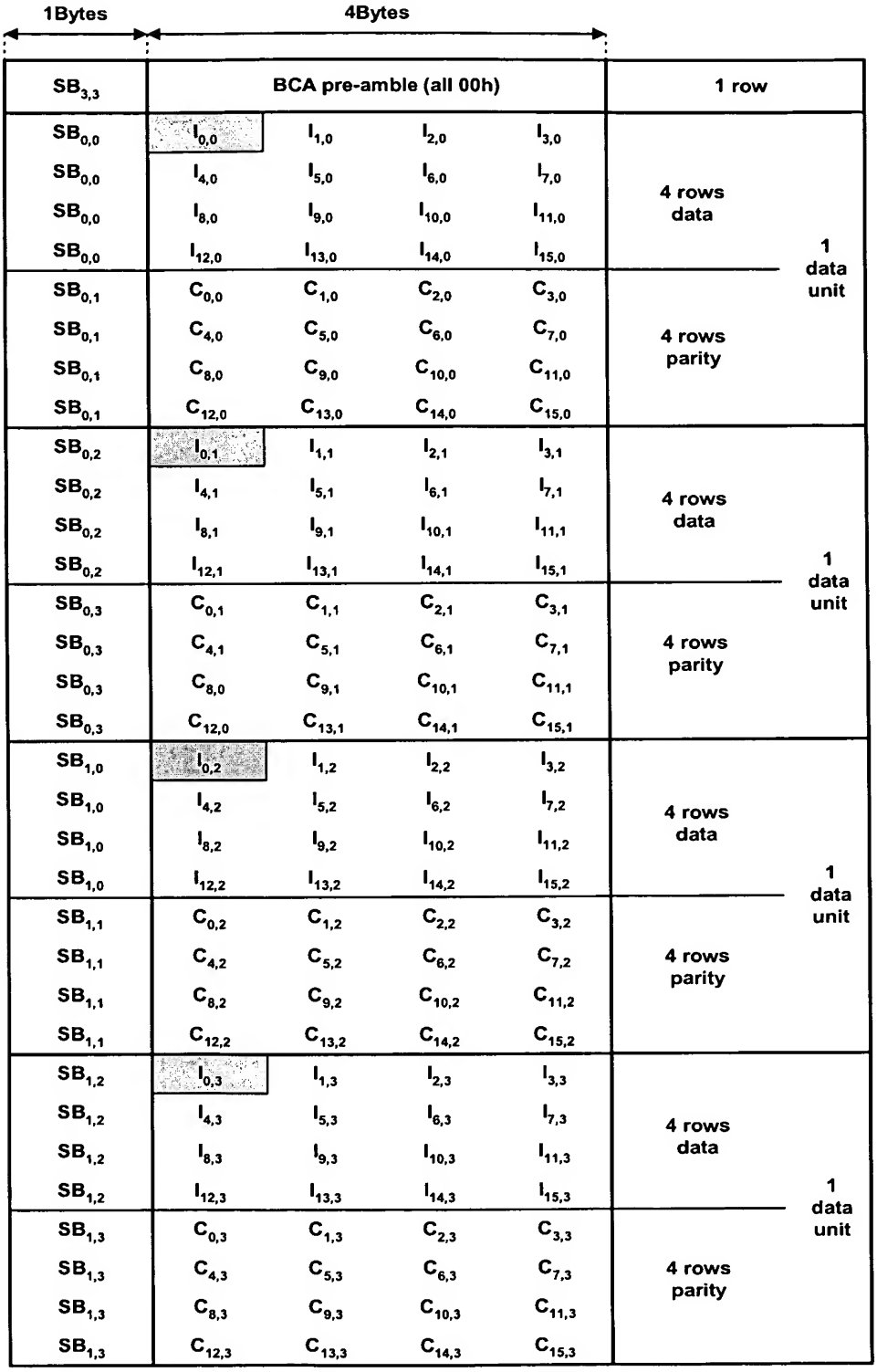

b31
b24
b23
b0
Sector Information
Sector Number
b31
b30
b29
b28
b27
b26
b26
b25
Sector format type
Tracking method
Reflectivity
reserved
Area type
Data type
Layer number
0b : CLV format
1b : Zoned format
0b : Pit tracking
1b : Groove tracking
0b : > 40 %
1b : <= 40 %
00b : Data
01b : Lead-In
10b : Lead-Out
11b : Middle
0b : Read-Only
1b : Others
0b : Layer 0
1b : Layer 1

[Fig. 3]

Blu-ray Disc

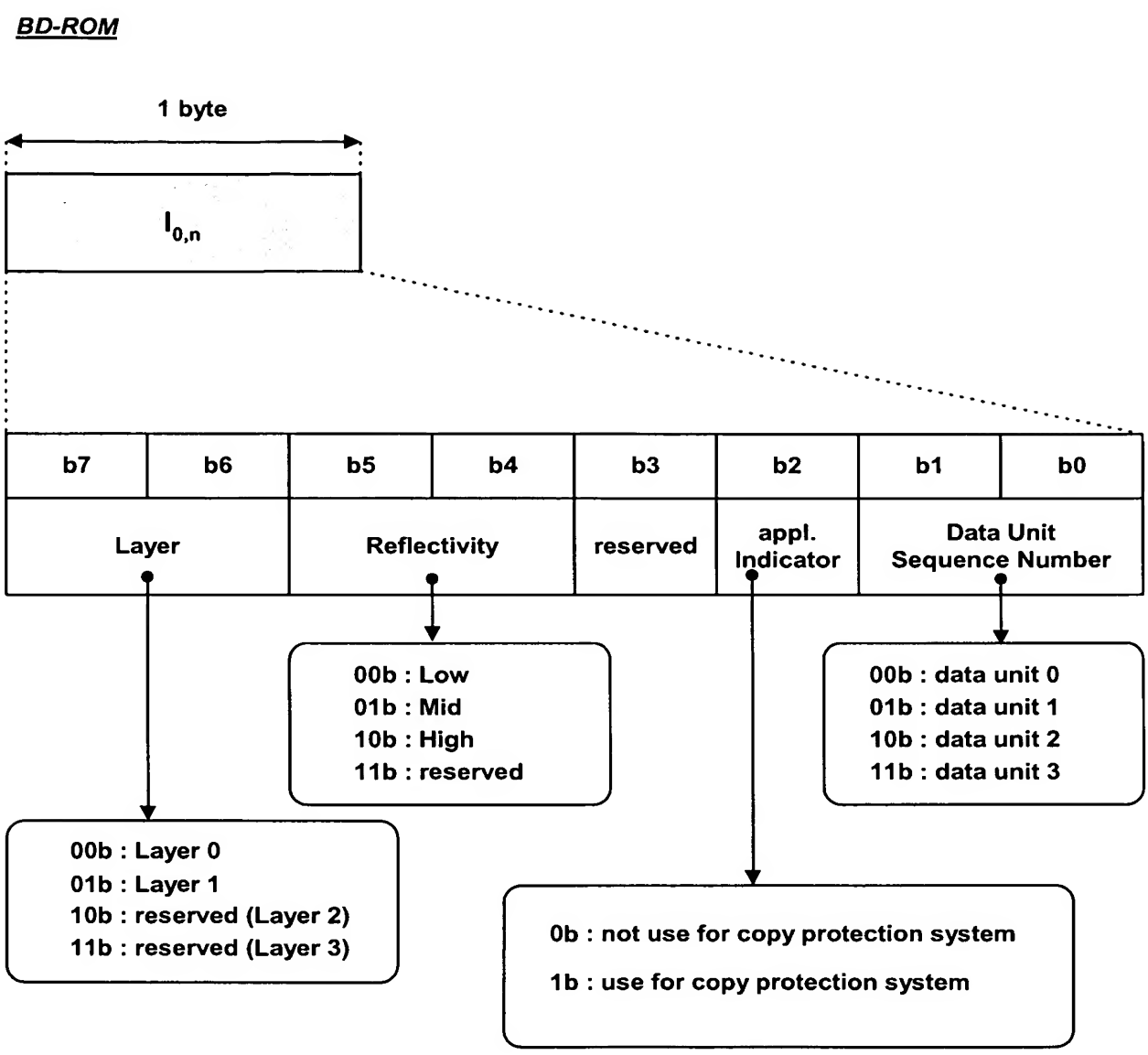


[Fig. 4]

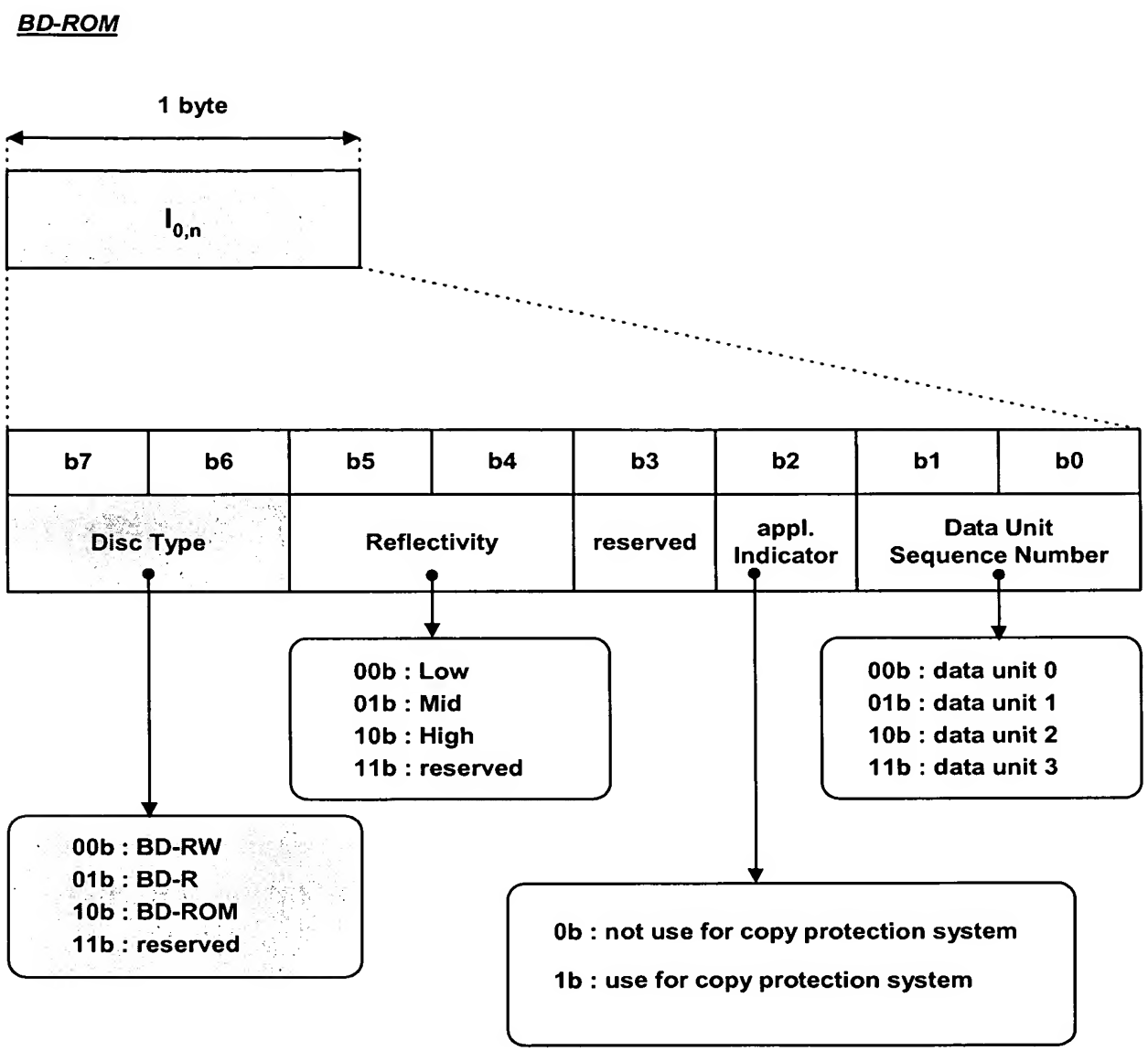


Data structure of BCA-code

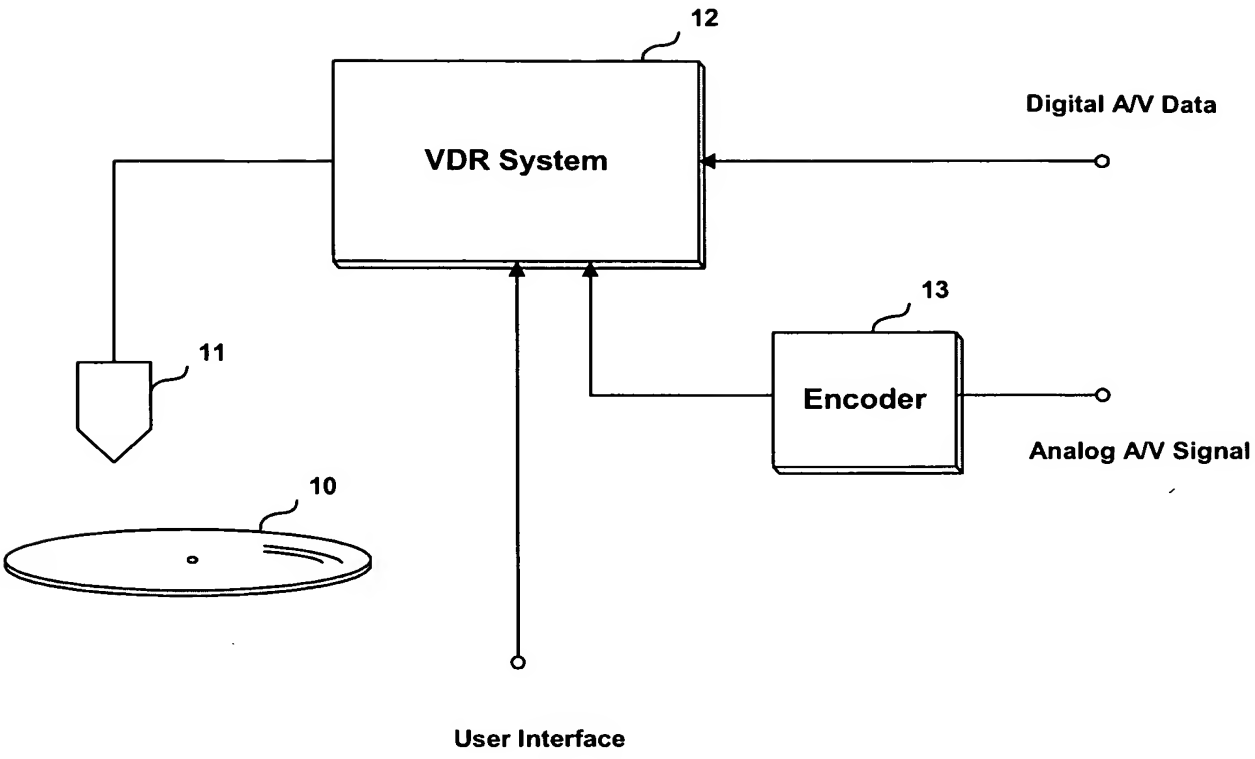
[Fig. 5]


BD-ROM
1 byte
$I_{0,n}$
b7
b6
b5
b4
b3
b2
b1
b0
Layer
Reflectivity
reserved
appl. Indicator
Data Unit Sequence Number
00b : Low
01b : Mid
10b : High
11b : reserved
00b : data unit 0
01b : data unit 1
10b : data unit 2
11b : data unit 3
00b : Layer 0
01b : Layer 1
10b : reserved (Layer 2)
11b : reserved (Layer 3)
0b : not use for copy protection system
1b : use for copy protection system

[Fig. 6]


BD-ROM
1 byte
$I_{0,n}$
b7
b6
b5
b4
b3
b2
b1
b0
Disc Type
Reflectivity
reserved
appl. Indicator
Data Unit Sequence Number
00b : Low
01b : Mid
10b : High
11b : reserved
00b : data unit 0
01b : data unit 1
10b : data unit 2
11b : data unit 3
00b : BD-RW
01b : BD-R
10b : BD-ROM
11b : reserved
0b : not use for copy protection system
1b : use for copy protection system

[Fig. 7]


12
VDR System
Digital A/V Data
13
Encoder
Analog A/V Signal
11
10
User Interface